ASPECTS OF THE WEED COMPONENT OF THE SPONTANEOUS VASCULAR FLORA OF HANCOCK COUNTY, ILLINOIS

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ABSTRACT: There are 338 weed species in the spontaneous vascular flora of Hancock County, Illinois, of which 34% are alien and 66% native. The weed species represent 28% of the county vascular flora and 76% of the Illinois vascular weed species. Of the alien species 47% were once cultivated, 85% are from the old world, 44% were in the county before 1881 and between 1833-1978 about one species was introduced per year. The weed species are about 1.2% pteridophytes, 0.3% gymnosperms and 98.5% angiosperms occurring in 70 families and 171 genera. Of the weed species 80% are herbaceous, 39% poisonous to humans, 14% poisonous to livestock, 25% are drug plants, 87% terrestrial, 34% annual and 60% perennial.

INTRODUCTION

The importance of weeds to mankind in that they reduce yields in agricultural systems has been often documented (Batra 1982, Boyer 1982, Holm 1969). It is therefore important for the understanding and management of them that the kinds of weeds present and their characteristics be continually monitored. Myers (1972) in his catalog of the Illinois vascular flora annotated the weeds of Illinois. Henry (1983a) discussed and updated the number of species in the Illinois weed flora. This paper endeavors to present a floristic profile of the current weed component of the spontaneous vascular flora of Hancock County, Illinois.

METHODS

The list of weeds used for this analysis (Henry 1983d) was derived by noting which plants in the present-day vascular flora of Hancock County, Illinois (Henry 1983c), are weeds in the spontaneous vascular flora of Illinois (Henry 1983b). Family and species nomenclature follow Mohlenbrock (1975). Data from Kibbe (1952) are based upon species that she states were verified from herbarium specimens.

RESULTS

1. The Alien and Native Weed Species

There are 338 vascular plant weed species which represent 27.8% of the present-day species in the Hancock County spontaneous vascular

flora. These weed species are 76.3% of the weed species in the Illinois flora. Of the 338 weed species 116 (34.3%) are alien and 222 (65.7%) are native species. Five (Ambrosia artemiisifolia, A. trifida, Cannabis sativa, Carduus nutans, Sorghum halepense) (1.5%) are on the official noxious weed list of Illinois (Ill. Dept. of Agric. 1978). Of Williams (1980) thirty-seven purposefully introduced plants into the United States that have become noxious or poisonous weeds six (1.8%) are weeds in Hancock County (Cannabis sativa, Agrostemma githago, Datura stramonium, Kochia scoparia, Linaria vulgaris, Sorghum halepense). Of Holm's (1969) ten worst weeds in the world three (0.9%) (Echinochloa pungens, Eleusine indica, Sorghum halepense), two of which are aliens, are weeds in the county.

2. Analysis of the Alien Weed Species

Of the 116 alien weed species 55 (47.4%) were once cultivated plants. Most of these species are from the old world (84.5%) while the fewest are from the United States outside of Illinois (6.9%) (6.0% from the west and 0.9% from the southwest). The rest (8.6%) are from the new world topics. Based on data from Kibbe (1952), Jones and Fuller (1955) and Mohlenbrock and Ladd (1978), 51 (44%) of the alien weed species were in the Hancock County flora before 1881, 27 (23.3%) arrived in the flora between 1882-1920, 21 (18.1%) between 1921-1955 and 17 (14.6%) arrived in the flora from 1956-1978. Thus the number of alien weed species introduced per year from about 1833-1881 was 1.06, between 1882-1920 was 0.71, between 1921-1955 was 0.62, between 1956-1978 was 0.77 and between about 1933-1978 was 0.8.

3. Taxonomic Distribution of the Weed Species

The weed species occur in four divisions: three (0.9%) in the Equisetophyta, one (0.3%) in the Polypodiophyta, one (0.3%) in the Pinophyta and 333 (98.5%) in the Magnoliophyta. Therefore four (1.2%) are pteridophytes, one (0.3%) gymnosperm and 333 (98.5%) are angiosperms. Of the angiosperms 62 (18.6%) are Liliopsida (monocots) and 271 (81.4%) are Magnoliopsida (dicots). The monocots represent 18.3% of the total weed flora species whereas the dicots compose 80.2%.

The weed species occur in 70 families. One (1.4%) belongs to the Equisetophyta, one (1.4%) is in the Polypodiophyta, one (1.4%) in the Pinophyta and 67 (95.8%) are Magnoliophyta. Thus the weed families are about 3% pteridophytes, 1% gymnosperms and 96% angiosperms. Within the angiosperms 12 (17.9%) are Liliopsida and 55 (82.1%) are Magnoliopsida. The monocots represent 17.1% of the total weed flora families whereas the dicots comprise 78.6%. The largest weed families are Compositae (63 species); Poaceae (Gramineae) (30); Rosaceae and Polygonaceae each with 15 species; Cruciferae (13); and the Fagaceae and Cyperaceae with 10 species each.

The weed species occur in 171 genera. One (0.6%) belongs to the Equisetophyta, one (0.6%) to the Polypodiophyta, one (0.6%) to the Pinophyta and 168 (98.2%) to the Magnoliophyta. Thus the weed genera are about 1.2% pteridophytes, 0.6% gymnosperms and 98.2% angiosperms. Within the angiosperms 32 (19%) are Liliopsida and 136 (81%) are Magnoliopsida. The monocots represent 18.7% of the total weed flora genera and the dicots 79.5%. The largest genera in the weed flora are Polygonum (11 species), Quercus (10), Potamogeton (8), Amaranthus (7), Solidago (7), Bidens (7), Eupatorium (6), Erigeron (6), Carya (6), Scirpus (5), Aster (5), Populus (5) and Prunus (5).

4. Woody and Herbaceous Habit of the Weed Species

Of the weed species 68 (20.1%) are woody and 270 (79.9%) are herbaceous. Of the woody species 13.2% (9) are alien and 86.8% (59) are native whereas the herbaceous species are 39.6% (107) alien and 60.4% (163) are native.

All of the pteridophytes are herbaceous, all of the gymnosperms woody and of the angiosperms 67 (20.1%) are woody and 266 (79.9%) are herbaceous. Of the angiosperm weed families 15 (22.4%) are woody and 55 (82.1%) are herbaceous (the total is over 67 and 100% due to the presence of both woody and herbaceous species in three families: Rosaceae, Rubiaceae and Leguminosae). Of all the weed families 57 (81.4%) are herbaceous and 16 (22.9%) are woody (the total is over 70 and 100% due to three families (Rosaceae, Rubiaceae, Leguminosae) having both woody and herbaceous species). Of all the weed genera 145 (84.8%) are herbaceous and 26 (15.2%) are woody. The largest herbaceous weed families are Compositae (63 species), Poaceae (30), Polygonaceae (15), Cruciferae (13) and Cyperaceae (10). The largest woody weed families are Rosaceae (13 species), Fagaceae (10), Salicaceae (9), Juglandaceae (6), Ulmaceae (5), and Anacardiaceae (5). The largest herbaceous weed genera are Polygonum (11 species), Potamogeton (8), Amaranthus (7), Solidago (7), Bidens (7), Eupatorium (6), Erigeron (6), Scirpus (5), and Aster (5). The largest woody weed genera are Quercus (10 species), Carya (6), Prunus (5), Populus (5), Rubus (4), Rhus (4), Salix (4), Ulmus (4), Fraxinus (3), Rosa (3) and Acer (3).

5. Poisonous Weed Species

Of the weed species 131 (38.8%) are poisonous to humans and 46 (13.6%) are poisonous to livestock. Plants poisonous to humans were determined from Hardin and Arena (1974) and for livestock from Evers and Link (1972).

6. Drug Plant Weed Species

Eighty-four (24.9%) of the weed species were on Tehon's (1951) list of Illinois drug plants.

7. Habitat of the Weed Species

Of the weed species 44 (13%) are aquatic and 294 (87%) are terrestrial.

8. Duration of the Weed Species

Of the weed species 115 (34%) are annual, 20 (5.9%) are biennial and 203 (60.1%) are perennial.

DISCUSSION

Hancock County presently has 76.3% of the Illinois weed species. The county weed flora is about 34% alien species and 66% native species which is nearly the same as for the Illinois weed flora. As is also true of the state weed flora, slightly less than one-half of the alien weed species were once cultivated and over four-fifths immigrated from the old world. The present-day weed flora of the county consists of 68 (20%) species of woody plants which is less than the 26% that compose the state's weed species. A much larger proportion (87%) of the woody weed species are native than are herbaceous weed species (60%).

Compared to the 116 alien weed species and 222 native weed species reported in this paper, Kibbe (1952) cited 35 alien species and 21 native species as weeds in her study of the Hancock County vascular flora. Twelve of the present-day alien weed species were listed as rare, not recently found or occurring at one or two stations by her: Agrostemma githago, Barbarea vulgaris arcuata, Bromus japonicus, Chrysanthemum leucanthemum, Digitaria ischaemum, Dipsacus sylvestris, Erysimum cheiranthoides, Euphorbia marginata, Galinsoga ciliata, Lychnis alba, Matricaria matricarioides, and Rumex obtusifolius. She noted that Galinsoga ciliata "has since become very abundant generally" and that Matricaria matricarioides has been "recently quite abundant." My observations have been that today Barbarea vulgaris arcuata, Chrysanthemum leucanthemum and Digitaria ischaemum are common. An interesting comment by Kibbe (1952) about the alien Portulaca oleracea is that "It is not a successful weed in Hancock County, although it is widely distributed." It is of interest to note that nearly one-half (44%) of the alien weed species were in the county flora before 1881 and that since this initial surge there were only four additional species between 1882-1903 whereas since 1904 their rate of entry has been rather constant being about 0.82 species per year. That data indicate that for some native species on the present-day weed list six have not been found since 1900, 27 were first reported in the flora between 1921-1955 and that 16 were first reported after 1955. Kibbe (1952) noted two present-day native weed species as rare (Diodia teres, Justicia americana) and some others were said to be at only one or two stations or several

stations. Today Justicia americana, although not rare, is of infrequent occurrence.

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